

WHAT IS CLAIMED IS:

- 1 1. A composition for producing colored synthetic fiber having improved color
2 strength and dimensional stability, the composition comprising:
 - 3 a) at least one fiber-forming polyamide,
 - 4 b) at least one thermoplastic polyester, said thermoplastic polyester being present
5 at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide
6 and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-
7 forming polyamide,
 - 8 c) a colorant system comprising at least one colorant selected from the group
9 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
10 organic pigments.
- 1 2. The composition of claim 1 wherein said colorant system includes at least one
2 carrier resin for said colorant.
- 1 3. The composition of claim 1 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.
- 1 4. The composition of claim 1 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6 and polyamide 6,6.
- 1 5. The composition of claim 1 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.
- 1 6. The composition of claim 1 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 7. The composition of claim 1 wherein said at least one said thermoplastic polyester
2 is present at between about 15 weight % and about 35 weight % with respect to the
3 total weight of the composition.

1 8. The composition of claim 1 wherein said at least one colorant is selected from the
2 group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc ferrites,
3 sodium alumino sulfo-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 9. The composition of claim 8 wherein said colorant is selected from the group
2 consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide, Ultramarine
3 Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60, Pigment
4 Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment Red 177,
5 Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272, Pigment
6 Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment Yellow
7 119, Pigment Yellow 147 and Pigment Yellow 150.

1 10. The composition of claim 1 wherein said colorant is present at between about 0.1
2 weight % and about 8 weight % of the composition.

1 11. The composition of claim 2 wherein the at least one carrier resin is selected from
2 the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 12. The composition of claim 2 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

1 13. The composition of claim 12 wherein said metal sulphonate polyester is selected
2 from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-
3 sulphisophthalate) and poly(butylene terephthalate-co-sulphisophthalate), and
4 blends and mixtures thereof.

- 1 14. The composition of claim 1, further comprising at least one adjuvant.
- 1 15. The composition of claim 14, wherein said at least one adjuvant is selected from
2 the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-
3 retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,
4 lubricant, melt viscosity enhancer, or mixtures thereof.
- 1 16. A composition for producing colored synthetic fiber having improved color
2 strength and dimensional stability, the composition comprising:
3 a) at least one fiber-forming polyamide,
4 b) at least one thermoplastic polyester, said thermoplastic polyester being present
5 at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide
6 and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-
7 forming polyamide,
8 c) a colorant system comprising at least one colorant selected from the group
9 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
10 organic pigments,
11 d) at least one polymeric compatibilising additive.
- 1 17. The composition of claim 16 wherein said colorant system includes at least one
2 carrier resin for said colorant.
- 1 18. The composition of claim 16 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.
- 1 19. The composition of claim 16 wherein said at least one fiber-forming polyamide is
2 selected from the group consisting of polyamide 6 and polyamide 6,6.
- 1 20. The composition of claim 16 wherein said at least one thermoplastic polyester is
2 selected from the group consisting of polyalkylene terephthalates, polyalkylene

3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 21. The composition of claim 16 wherein said at least thermoplastic polyester is
2 selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 22. The composition of claim 16 wherein said at least one thermoplastic polyester is
2 present at between about 15 weight % and about 35 weight % with respect to the total
3 weight of the composition.

1 23. The composition of claim 16 wherein said at least one polymeric compatibiliser
2 additive is a metal sulphonate polyester.

1 24. The composition of claim 16 wherein said at least one polymeric compatibiliser
2 additive is selected from the group consisting of alkali metal salts of poly(ethylene
3 terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-
4 sulphoisophthalate), and blends and mixtures thereof.

1 25. The composition of claim 23 wherein said metal sulphonate polyester is present
2 between 1 weight % and 25 weight % of the composition.

1 26. The composition of claim 23 wherein said metal sulphonate polyester is added in
2 an amount such that the composition has between about 300 and about 3500 ppm
3 sulphur.

1 27. The composition of claim 16 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulfo-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 28. The composition of claim 16 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 29. The composition of claim 16 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 30. The composition of claim 17 wherein said at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 31. The composition of claim 17 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

1 32. The composition of claim 31 wherein said metal sulphonate polyester is selected
2 from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-
3 sulphisophthalate) and poly(butylene terephthalate-co-sulphisophthalate), and
4 blends and mixtures thereof.

1 33. The composition of claim 16, further comprising at least one adjuvant.

1 34. The composition of claim 33, wherein said at least one adjuvant is selected from
2 the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-
3 retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,
4 lubricant, melt viscosity enhancer, or mixtures thereof.

1 35. A process for producing colored synthetic fiber composition, with improved color
2 strength and dimensional stability, the process comprising:

3 (1) melt blending:

- 4 a) at least one fiber-forming polyamide,
5 b) at least one thermoplastic polyester, said at least one thermoplastic polyester
6 being present at a ratio of less than 2:1 by weight with respect to said at least one
7 fiber-forming polyamide and forming a dispersed, non-continuous, minor phase in a
8 matrix of said at least one fiber-forming polyamide,
9 c) a colorant system comprising at least one colorant selected from the group
10 consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
11 organic pigments;
12 (2) forming said melt blend into filaments; and
13 (3) drawing said filaments into fibers.

1 36. A process according to claim 35 wherein said colorant system employed in the
2 step of melt blending includes at least one carrier resin for said colorant.

1 37. A process according to claim 35 comprising the further step of texturing said
2 fibers subsequent to drawing said filaments into fibers.

1 38. A process according of claim 35 wherein said at least one fiber-forming polyamide
2 is selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,
3 polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures
4 thereof.

1 39. A process according to claim 35 wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1 40. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 41. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is selected from the group consisting of poly(ethylene terephthalate), poly(propylene

3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 42. A process according to claim 35 wherein said at least one thermoplastic polyester
2 is present at between about 15 weight % and about 35 weight % with respect to the
3 total weight of the composition.

1 43. A process according to claim 35 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 44. A process according to claim 35 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 45. A process according to claim 35 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 46. A process according to claim 36 wherein the at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 47. A process according to claim 36 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

1 48. A process according to claim 47 wherein said metal sulphonate polyester is
2 selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-

3 *co*-sulphoisophthalate) and poly(butylene terephthalate-*co*-sulphoisophthalate), and
4 blends and mixtures thereof.

1 49. A process according to claim 35 including the further step of adding at least one
2 adjuvant.

1 50. A process according to claim 49 wherein said at least one adjuvant is selected
2 from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial,
3 flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic
4 additive, lubricant, melt viscosity enhancer, or mixtures thereof.

1 51. A process according to claim 35 wherein a draw ratio in said drawing step is from
2 1.05 to 7.00.

1 52. A process according to claim 35 wherein a draw ratio in said drawing step is from
2 1.10 to 6.00.

1 53. A fiber made from the process of claim 35.

1 54. A fiber made from the process of claim 37.

1 55. A fiber made from the process of claim 48.

1 56. A fiber made from the process of claim 35 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta and trilobal.

1 57. A fiber made from the process of claim 37 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal.

1 58. A fiber made from the process of claim 48 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal

1 59. A woven, knitted or pile textile article made from the fiber of claim 53.

- 1 60. A woven, knitted or pile textile article made from the fiber of claim 54.
- 1 61. A woven, knitted or pile textile article made from the fiber of claim 55.
- 1 62. A carpet or floorcovering made from the fiber of claim 53.
- 1 63. A carpet or floorcovering made from the fiber of claim 54.
- 1 64. A carpet or floorcovering made from the fiber of claim 55.
- 1 65. A fiber made from the composition of claim 1.
- 1 66. A fiber made from the composition of claim 13.
- 1 67. A fiber made from the composition of claim 16.
- 1 68. A fiber made from the composition of claim 24.
- 1 69. A process for producing colored synthetic fiber composition, with improved color
2 strength and dimensional stability, the process comprising:
3 (1) melt blending:
4 a) at least one fiber-forming polyamide,
5 b) at least one thermoplastic polyester, said at least one thermoplastic
6 polyester being present at a ratio of less than 2:1 by weight with respect
7 to said at least one fiber-forming polyamide and forming a dispersed,
8 non-continuous, minor phase in a matrix of said at least one fiber-
9 forming polyamide,
10 c) a colorant system comprising at least one colorant selected from the
11 group consisting of inorganic pigments, organic pigments, and
12 mixtures of inorganic and organic pigments;
13 d) at least one polymeric compatibilising additive;
14 (2) forming said melt blend into filaments; and
15 (3) drawing said filaments into fibers.

1 70. A process according to claim 69, wherein said colorant system employed in the
2 step of melt blending includes at least one carrier resin for said colorant.

1 71. A process according to claim 69, comprising the further step of texturing said
2 fibers subsequent to drawing said filaments into fibers.

1 72. A process according to claim 69, wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6, polyamide 11,
3 polyamide 12, polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers,
4 blends and mixtures thereof.

1 73. A process according to claim 69, wherein said at least one fiber-forming
2 polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1 74. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is selected from the group consisting of polyalkylene terephthalates, polyalkylene
3 succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or
4 mixtures thereof.

1 75. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is selected from the group consisting of poly(ethylene terephthalate), poly(propylene
3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures
4 thereof.

1 76. A process according to claim 69, wherein said at least one thermoplastic polyester
2 is present at between about 15 weight % and about 35 weight % with respect to the
3 total weight of the composition.

1 77. A process according to claim 69 wherein said at least one polymeric
2 compatibiliser additive is a metal sulphonate polyester.

1 78. A process according to claim 69 wherein said at least one polymeric
2 compatibiliser additive is selected from the group consisting of alkali metal salts of

3 poly(ethylene terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-
4 co-sulphoisophthalate), and blends and mixtures thereof.

1 79. A process according to claim 77 wherein said metal sulphonate copolymer is
2 present at between about 1 weight % and about 25 weight % of the melt blend.

1 80. A process according to claim 77 wherein said metal sulphonate polyester is added
2 in an amount such that the melt blend has between about 300 and about 3500 ppm
3 sulphur.

1 81. A process according to claim 69 wherein said at least one colorant is selected from
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc
3 ferrites, sodium alumino sulfo-silicate pigments, carbon blacks, phthalocyanines,
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and
5 perylenes.

1 82. A process according to claim 69 wherein said at least one colorant is selected from
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 83. A process according to claim 69 wherein said at least one colorant is present at
2 between about 0.1 weight % and about 8 weight % of the composition.

1 84. A process according to claim 70 wherein the at least one carrier resin is selected
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and
3 copolymers, blends and mixtures thereof.

1 85. A process according to claim 70 wherein said at least one carrier resin is a metal
2 sulphonate polyester.

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86. A process according to claim 85 wherein said metal sulphonate polyester is selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and blends and mixtures thereof.

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87. A process according to claim 69 including the further step of adding at least one adjuvant.

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88. A process according to claim 87 wherein said at least one adjuvant is selected from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial, flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive, lubricant, melt viscosity enhancer, or mixtures thereof.

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89. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.05 to 7.00.

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90. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.10 to 6.00.

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91. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.05 to 7.00.

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92. A process according to claim 69 wherein a draw ratio in said drawing step is from 1.10 to 6.00.

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93. A fiber made from the process of claim 69.

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94. A fiber made from the process of claim 71.

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95. A fiber made from the process of claim 86.

1 96. A fiber made from the process of claim 69 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta and trilobal.

1 97. A fiber made from the process of claim 71 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal.

1 98. A fiber made from the process of claim 86 wherein said fiber has a cross-section
2 selected from the group consisting of round, delta, and trilobal.

1 99. A woven, knitted or pile textile article made from the fiber of claim 93.

1 100. A woven, knitted or pile textile article made from the fiber of claim 94.

1 101. A woven, knitted or pile textile article made from the fiber of claim 95.

1 102. A carpet or floorcovering made from the fiber of claim 93.

1 103. A carpet or floorcovering made from the fiber of claim 94.

1 104. A carpet or floorcovering made from the fiber of claim 95.